

# PORTABLE VACUUM CLEANER

## FIELD OF THE INVENTION

The present invention relates to a portable vacuum cleaner used for  
5 dust removal from a computer and other devices.

## BACKGROUND OF THE INVENTION

At the present time, vacuum cleaners for computer devices commonly  
use a battery as the power supply and are equipped with changeable suction  
10 nozzles of various shapes. However, the bulky dimension of this kind of  
vacuum cleaner makes it difficult to collect dust expediently. Moreover, the  
narrow and deep crevices exist in many computer devices dampen the  
vacuum efficiency. It is therefore evident that there is a need for an improved  
vacuum cleaner for computer devices.

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## SUMMARY OF THE INVENTION

An objective of the present invention is to overcome the disadvantages  
of existing vacuum cleaners for computer devices, especially for keyboards,  
and to provide an easy-to-use and portable vacuum cleaner with high  
20 vacuuming efficiency.

The portable vacuum cleaner in one embodiment of the present  
invention comprises a shell, an electric motor, a power cord, an impeller, an  
airtight loop, a filter and a suction nozzle. In this vacuum cleaner, (1) the  
power plug may have an end-to-end joint with the Universal Serial Bus (USB)  
25 interface of a computer; (2) a head lamp may be mounted below the external  
surface in the middle axial part of the shell; (3) the cross-sectional view of the  
suction nozzle takes the shape of an elongated thin pipe; (4) the  
disassembling connection is between the suction nozzle and the shell; (5) a  
brush having one end longer than the intake surface of the suction nozzle is  
30 located on the external surface of the suction nozzle; and (6) a hanging loop  
is located above the power cord near the end of the shell.

In this novel practical vacuum cleaner, the end-to-end joint between the  
power plug and USB interface of a computer allows power to be easily

supplied to the vacuum. The head lamp at the lower part of the vacuum cleaner makes it easy to suck dust inside a computer or in dim light. Changing suction nozzles with different shapes based on requirements and the brush being on the external circle surface of the nozzle allows dust to be removed  
5 from the narrow crevices among components inside and outside the computer devices. Furthermore, the nozzle can reach these narrow crevices to suck dust. A hanging loop above the power cord makes it easy to store the vacuum cleaner near the computer devices. Therefore, this vacuum cleaner is a portable, handy, practical and highly efficient dust suction equipment for  
10 computer devices, and even for other instruments.

The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawings.

15 **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is an axial cross-sectional view of the novel portable vacuum cleaner of the present invention.

FIG. 2 is a sectional view of an alternate vacuum cleaner suction nozzle for Part C in FIG. 1.

20 FIG. 3 is a cross-sectional view of the suction nozzle of FIG. 1.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring to FIG. 1, the present novel portable vacuum cleaner includes a shell 1, an electrical motor 2 with proper input voltage and power to  
25 supply power to the vacuum cleaner, a power cord 3 with its power plug 9 having an end-to-end joint with UBS interface of a computer, an impeller 4, an airtight loop 5, a filter 11 and a suction nozzle 6. In order to vacuum dust inside a computer or in dim light, an indicator lamp base located below the external surface in the middle axial part of shell 1 can be used to install a light emitting diode (LED) head lamp 7 with relatively higher power. The disassembling connection between the suction nozzle 6 and the shell 1 makes it possible to change suction nozzles with different shapes based on  
30 the dusting requirements.

Referring to FIG. 2, a brush 8 has a distal end (not illustrated) which extends beyond the intake surface of a suction nozzle 6'. The nozzle 6' is preferably in the form of three parallel cylindrical tubes. The brush 8 is located on the external circular surface of the suction nozzle 6' tubes to enable suction to be accomplished in the narrow crevices among components inside and outside computer devices. Additionally, suction nozzle 6 without the brush 8 can reach the narrow deep crevices to remove dust with the elongated thin pipe 15 (see cross-sectional view shape), for example, from the narrow spaces in the keyboard. The cross-section view shape may also be somewhat flattened at the opposed ends and enlarged in the middle portions. A hanging loop 10 on the power cord 3 near the end of shell 1 allows the vacuum cleaner to be easily stored near the computer devices. With all the above features, this vacuum cleaner can be considered as a portable, handy, practical and highly efficient dust suction equipment for computer devices.

It is to be understood that the embodiments depicted in the patent specification herein are not intended to be, nor should they be deemed to be, limited thereby and such other modifications or embodiments without departing from the spirit and essential characteristics of such invention herein are particularly reserved especially as they fall within the breadth and scope of the claims here appended.